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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,049	02/21/2002	David A Nadin	540-333	9300

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EXAMINER	
GARBER, CHARLES D	

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/069,049	NADIN, DAVID A	
	Examiner	Art Unit	
	Charles D. Garber	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *7* is/are allowed.

6)☒ Claim(s) *1-3,5,6 and 9* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

In view of the Appeal Brief filed on 09/13/2004, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the datum vacuum value" in line 12 of the claim. There is insufficient antecedent basis for this limitation in the claim.

For purposes of further examination on the merits Examiner will assume --a datum vacuum value--.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston et al. (US Patent 5,404,747) in view of Newbill, Jr. (US Patent 2,647,399), Schupack et al. (US Patent 4,979,390), Doris et al. (US Patent 6,564,614), Bogle et al (US Patent 5,319,956), Bosselaar (US Patent 3,738,156) and McRae et al. (US Patent 5,161,408).

Regarding claim 1, Johnston discloses a portable vacuum test tool to be used for detection of leaks around sealed areas of structure to be pressurized (title and column 1 lines 6-8) including an air impervious seal sheet 15 or vacuum tight cover which is sealed to the surface of the structure as shown in figure 3 where a leak may exist.

The structure 42 of the reference is considered to be empty in the same manner as the container of the reference as there is no provision in the instant invention to remove all fluid from the container including liquid and particularly gas fluids and it

appears the invention may only work while there is gaseous fluid still remaining in the container. Further the structure of the reference is intended to be tested during production or scheduled maintenance when there is typically no cargo within the structure but there is still gaseous fluid within.

Johnston however does not expressly seal the sheet or cover circumferentially which Examiner interprets to be a specific sealing feature along the cover periphery based on a reading of the specification.

Newbill teaches a seal 7 around the circumference or periphery of suction sheet 5 placed against a structure 1 (column 2 lines 7-12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to place a seal around the circumference of a suction sheet in order to prevent leakage of air around the open edges.

Johnston further discloses removing the air between the cover and sealed region of the surface by virtue of the vacuum source 70 fluidly connected to the sheet through a plenum 25 and inlet area 28. Johnston also discloses using a leak detection device 95 to check suspect areas and "pinpoint" the exact location of the leak (column 3 lines 49-60).

Johnston further discloses establishing a "proper vacuum" between the cover and the sealed region of the surface (column 3 line 49) but does not expressly recite measuring the maximum vacuum; comparing the measured vacuum with a predetermined acceptable datum vacuum value.

Schupack discloses testing the permeability of materials (title) including a test apparatus 10 that is placed over the material to form a localized seal as shown in figure 1. In this case, permeability is an indication of the material's tendency to leak air when the material is of poor quality containing cracks and fissures (abstract). Schupack teaches developing a reference baseline pressure decay value with a specimen of good quality which is equivalent to obtaining a predetermined acceptable datum vacuum value as in the instant invention (column 9 line 67 to column 10 line 15, see also figure 7 which shows the reference value to be consistent and maximum line as a function of time).

Schupack teaches measuring test structure and comparing the decay rate with the reference decay rate. If the test decay rate is greater by a certain percentage the test structure is compromised (column 10 lines 16-25).

In pursuit of this objective, Schupack applies a vacuum with a vacuum pump until it reaches a maximum (equivalent to datum vacuum value) at which time it is switched off and the pressure observed and taken (equivalent to recording maximum consistent vacuum achieved as datum vacuum value) at zero seconds and after a subsequent predefined interval (column 8 lines 28-38 and column 10 lines 42-44). Schupack takes or records the maximum vacuum pressure achieved as a basis for conducting a comparative pressure testing with a pristine or leak free standard or reference.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to take or record a maximum vacuum achieved as a datum vacuum

value in order to establish a reference for subsequent comparison to an acceptable standard.

Though Schupack is concerned with comparative pressure change rates rather than comparative achievable pressures Doris teaches if -

(1) a pump is unable to achieve a predetermined vacuum, and

(2) if the vacuum measurement indicates a vacuum decay rate exceeding a predetermined rate,

then a test object is not tight (column 4 lines 12-18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to first compare achievable vacuum to a predetermined or datum value (before a decay test) in order to determine if there is a gross leak. Examiner takes OFFICIAL NOTICE that it is widely known in the art that if there is first evidence of a gross leak such that a target start pressure cannot be reached there is no point in further attempting to determine a decay rate associated with a fine leak. Further attempts to determine a decay rate would be a fruitless waste of time.

Johnston is unclear whether the detection device 95 is to be used on the outside of the structure or the inside upon gaining access as in the instant invention. Johnston simply recites the detector, such as a listening tube, it brought into proximity of the seal and shows detector in figure 3 indeterminately off to the side (column 3 lines 49-60).

Bogle teaches accessing the inside of a tank 10 in order to position a microphone 100 inside the unfilled portion of the tank and listen for leaks (abstract and figure 1).

The microphone is placed inside the tank because access to the outside of the tank to listen for leaks is blocked, in this case by the surrounding ground.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to place a microphone on the inside of a tank to listen for leaks when there is interference in accessing the structure outside the tank.

Finally, Johnston does not expressly teach recording the exact location of the source of fluid leaks.

Bosselaar teaches leak detection provided with recording equipment for recording the location of the leak (column 1 lines 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to record the location of the leak so that the defective area can be later repaired by personnel trained and equipped for effecting structural repairs. Typically, non-destructive inspection (NDI) technicians and repair personnel are not one in the same and repair personnel would need some indication of where defects have been found.

The references also lack performing the localized testing with a leak detector device as a condition of the comparative pressure test failure.

McRae teaches leak tests of door seals are tested with air to some specified overpressure then monitored for a period of time to see if the pressure decays below a specified value (column 1 lines 13-25). If the component fails it is taken out of production and subjected to further testing such as with soaping or using a tracer gas

sniffer (which is a leak detector device) to pinpoint the leak source (column 1 lines 44-50).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform a localized testing with a leak detector device as a condition of the comparative pressure test so that a component with a leak may have the leak source identified after being screened by a more "simple, cost effective leak checking method". Once the leak source is precisely known it may be fixed and the component returned to production.

As for claim 2, Schupack further teaches circumferentially sealing and removing air from a local region on a surface where there are no joins or seams and recording the maximum consistent vacuum achieved as the datum vacuum value. This is done to determine if the material itself is compromised.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to test in an area where there are no seals or joins in order to determine if the material of a structure itself is compromised. Material compromised in this manner would be of unacceptable strength (column 1 lines 47-50).

As for claim 5, Johnston discloses the leak detector used is an ultrasonic leak detector (column 3 lines 49-60).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston et al. (US005404747A) in view of Newbill, Jr. (US002647399A), Schupack et al. (US004979390A), Bogle et al (US005319956A) and Bosselaar (US003738156A).

Johnston discloses a portable vacuum test tool to be used for detection of leaks around sealed areas of structure to be pressurized (title and column 1 lines 6-8) including an air impervious seal sheet 15 or vacuum tight cover which is sealed to the surface of the structure as shown in figure 3 where a leak may exist.

The structure 42 of the reference is considered to be empty in the same manner as the container of the reference as there is no provision in the instant invention to remove all fluid from the container including liquid and particularly gas fluids and it appears the invention may only work while there is gaseous fluid still remaining in the container. Further the structure of the reference is intended to be tested during production or scheduled maintenance when there is typically no cargo within the structure but there is still gaseous fluid within.

Johnston however does not expressly seal the sheet or cover circumferentially which Examiner interprets to be a specific sealing feature along the cover periphery based on a reading of the specification.

Newbill teaches a seal 7 around the circumference or periphery of suction sheet 5 placed against a structure 1 (column 2 lines 7-12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to place a seal around the circumference of a suction sheet in order to prevent leakage of air around the open edges.

Johnston further discloses removing the air between the cover and sealed region of the surface by virtue of the vacuum source 70 fluidly connected to the sheet through a plenum 25 and inlet area 28. Johnston also discloses using a leak detection device

95 to check suspect areas and "pinpoint" the exact location of the leak (column 3 lines 49-60).

Johnston lacks measuring the vacuum between the cover and the sealed region of the surface over a predetermined period and comparing the measured vacuum with a predetermined acceptable vacuum value.

Schupack discloses testing the permeability of materials (title) including a test apparatus 10 that is placed over the material to form a localized seal as shown in figure 1. In this case, permeability is an indication of the material's tendency to leak air when the material is of poor quality containing cracks and fissures (abstract). Schupack teaches developing a reference baseline pressure decay value with a specimen of good quality which is equivalent to obtaining a predetermined acceptable datum vacuum value as in the instant invention (column 9 line 67 to column 10 line 15, see also figure 7 which shows the reference value to be consistent and maximum line as a function of time). Schupack further teaches measuring test structure and comparing the decay rate with the reference decay rate. If the test decay rate is greater by a certain percentage the test structure is compromised (column 10 lines 16-25). This is considered equivalent to measuring the vacuum between the cover and seal region and comparing the measurment to an acceptable datum or reference where the vacuum exceed the reference (in this case some percentage more than a pristine sample). Schupack also teaches the pressure measurements taken over a predetermined period of 300 seconds (column 10 lines 42-44).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to test a material with a vacuum decay process in the manner above in order to advantageously identify material in a structure that has been compromised.

Johnston is unclear whether the detection device 95 is to be used on the outside of the structure or the inside upon gaining access as in the instant invention. Johnston simply recites the detector, such as a listening tube, it brought into proximity of the seal and shows detector in figure 3 indeterminately off to the side (column 3 lines 49-60).

Bogle teaches accessing the inside of a tank 10 in order to position a microphone 100 inside the unfilled portion of the tank and listen for leaks (abstract and figure 1). The microphone is placed inside the tank because access to the outside of the tank to listen for leaks is blocked, in this case by the surrounding ground.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to place a microphone on the inside of a tank to listen for leaks when there is interference in accessing the structure outside the tank.

Finally, Johnston does not expressly teach recording the exact location of the source of fluid leaks.

Bosselaar teaches leak detection provided with recording equipment for recording the location of the leak (column 1 lines 21-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to record the location of the leak so that the defective area can be later repaired by personnel trained and equipped for effecting structural repairs.

Typically, non-destructive inspection (NDI) technicians and repair personnel are not one in the same and repair personnel would need some indication of where defects have been found.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston et al. (US005404747A) in view of Newbill, Jr. (US002647399A), Schupack et al. (US004979390A), Bogle et al (US005319956A), Bosselaar (US003738156A) and McRae et al. (US Patent 5,161,408).

Claim 9 is substantively the same as claim 3 except the references lack performing the localized testing with a leak detector device as a condition of the comparative pressure test.

McRae teaches leak tests of door seals are tested with air to some specified overpressure then monitored for a period of time to see if the pressure decays below a specified value (column 1 lines 13-25). If the component fails it is taken out of production and subjected to further testing such as with soaping or using a tracer gas sniffer (which is a leak detector device) to pinpoint the leak source (column 1 lines 44-50).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform a localized testing with a leak detector device as a condition of the comparative pressure test so that a component with a leak may have the leak source identified after being screened by a more "simple, cost effective leak checking method". Once the leak source is precisely known it may be fixed and the component returned to production.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnston et al. (US005404747A) as modified by Newbil, Jr. (US Patent 2,647,399), Schupack et al. (US Patent 4,979,390), Doris et al. (US Patent 6,564,614), Bogle et al (US Patent 5,319,956), Bosselaar (US Patent 3,738,156) and McRae et al. (US Patent 5,161,408) and applied to claim 1 above and further in view of Frenkel et al. (US005182941A)

The reference lack repairing the leak source and repeating the method and repairing any further sources found. Frenkel discloses a pressure based leak test teaching the "leak detection cycle ... is repeated to detect any leaks missed in the first ... or that were not properly repaired or corrected. The pressurization, detection and repair cycle is repeated until no more leaks are found".

It would have been obvious to one having ordinary skill in the art at the time the invention was made to repeat a leak detection test after repair of a previously detected leak in order to advantageously ensure leaks are properly repaired and that all leaks are detected and repaired.

As discussed above, the Johnston reference previously taught the structure at least filled with gaseous fluid in order for there to be a passage of fluid to the vacuum side to create a detectable source of leakage.

Allowable Subject Matter

Claims 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 is allowed.

Please see earlier Office Action for reasons for allowance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles D. Garber whose telephone number is (571) 272-2194. The examiner can normally be reached on 6:30 a.m. to 3:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cdg